Space Weather Forecast

Issued on Tuesday, 30 January 2024 at 13:30 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

Space Weather Forecast Headline: Chance of further R1/R2 Radio Blackouts. Possible glance from a coronal mass ejection and Chance of G1 day 2 (31 Jan). Chance of S1 Radiation Storms reoccurring should and significant flares occur.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity is now Low, with a peak common-class flare peaking at 29/1456 UTC. There are currently six sunspot regions on the facing side of the Sun, two are of note. AR3559 in the northwest is in the process of rotating off the disk, has a history of Moderate-class flares, and is the culprit of a large CME emitted on 29 Jan. The new region in the far northeast is a developing region, looking moderately sized and complex at present but has the ability to produce Moderate-class flares. There is a reducing chance of R1 Minor or R2 Moderate Radio Blackouts through the period due to the former spot rotating off the visible disk entirely in the next 36 hours.

No Earth-directed coronal mass ejections were evident in coronagraph imagery.

Solar Wind / Geomagnetic Activity: Solar winds, as measured by DSCOVR and ACE at L1 showed a likely transition between the fast winds of two separate coronal holes. The solar wind was at slightly elevated levels, between around 400-500 km/s. The Interplanetary Magnetic Field was weak throughout and on a general decline. The north-south component varied weakly with an erratic character which also weakened with time. The net result of the above solar wind measures was Quiet (Kp 0-2) geomagnetic activity.

Energetic Particles / Solar Radiation: High energy proton flux was above S1 radiation levels until 30/0425 UTC, and briefly above S2 radiation levels between 29-1740-1900 UTC. This was in response to the Moderate flare earlier on 29 Jan. The high energy proton flux has been on a gradual decline ever since but remained elevated compared to background levels.

Four-Day Space Weather Forecast Summary

Solar Activity: Chance of further Moderate class flares and a Slight Chance of isolated Strong class flares in the near term. This risk reducing somewhat into the period as the large spot on the northwest limb fully departs the visible disk around midweek UTC.

Solar Wind / Geomagnetic Activity: Generally Quiet to Unsettled conditions expected in association with faster wind influence initially, with a chance of Active intervals. The peak risk of geomagnetic activity into day 2 (31 Jan) associated with the 29/0438UTC Moderate X-ray flare-tied CME, with Active intervals likely and a chance of G1 Minor Geomagnetic Storms.

Energetic Particles / Solar Radiation: High energy proton flux is Expected to remain below the S1 Radiation Storm level, with only a Chance of going above, should any significant flares occur on day 1 (30 Jan). This risk reduces through the period back in line with raw probabilities.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	10	40	5	10
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	40	30	30	30
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	Yes	25	10	5	5
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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